SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-43

Name: Twin Lakes **County**: Sanborn
Legal Description: T106N-R62W-Sec.30-31; T106-R63-Sec. 24-25
Location from nearest town: 6 miles south and 3 miles west of Woonsocket, SD

Dates of present survey: July 5-6, 2010
Dates of last survey: July 6-7, 2009

Managed Species	Other Species
Walleye	White Sucker
Black Crappie	Northern Pike
Black Bullhead	Orange-spotted Sunfish
Common Carp	
Bigmouth Buffalo	
Yellow Perch	

PHYSICAL DATA

Surface Area: 252 acres
Maximum depth: 12.5 feet
Volume: 1,512 acre-feet
Contour map available: Yes
OHWM elevation: None set
Outlet elevation: None set
Watershed: 1,118 acres
Mean depth: 6 feet
Shoreline length: 13.1 miles
Date mapped: 1990
Date set: NA
Date set: NA
Lake elevation observed during the survey: Full
Beneficial use classifications: (5) warmwater semipermanent fish life propagation, (7) immersion recreation, (8) limited-contact recreation and (9) wildlife propagation and stock watering.

Ownership of Lake and Adjacent Lakeshore Properties

Twin Lakes was so named because its two basins are nearly identical in size and joined by a narrow channel. The lake is not listed as meandered public water in the State of South Dakota Listing of Meandered Lakes; however, the fishery is managed by the South Dakota Department of Game, Fish and Parks (GFP). GFP also owns and manages a 50-acre Lake Access Area on the west side of the lake. The remainder of the shoreline is privately owned.

Fishing Access

The Twin Lakes Recreation Area, located on the west shore, contains a double lane boat ramp, dock, picnic area, primitive campground, public toilet and shore fishing access.

Field Observations of Water Quality and Aquatic Vegetation:

Water clarity during the survey was poor with a Secchi depth of 0.4 m (16 in). A few small beds of sago pondweed (*Potamageton pectinatus*) were observed in shallow water while common cattail (*Typha spp*.) and bulrush (*Scirpus spp*.) were abundant around much of the shoreline.

BIOLOGICAL DATA

Methods:

Twin Lakes was sampled on July 5-6, 2010 with three overnight gill net sets and five overnight trap net sets. The trap nets are constructed with 19-mm-bar-mesh (¾ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh (½, ¾, 1, 1¼, 1½, and 2 in) monofilament netting. Sampling locations are displayed in Figure 3.

Winterkill:

Twin Lakes experiences frequent winterkills due to its shallow basin and hypereutrophic condition. A severe winterkill occurred in 2007-2008 with only few black bullheads and small common carp showing up in test nets set after ice out. The lake was restocked with adult black crappies and walleye fry in 2008 (Table 9), but may have winterkilled again in 2008-2009. Few fish were caught by anglers in 2009, and subsequently, the lake was stocked again that year with walleye and yellow perch. The lake winterkilled a third time during the winter of 2009-2010 prompting additional stocking of walleyes, black crappie and yellow perch this year.

Results and Discussion:

Gill Net Catch

Black crappie (46.2%) and black bullhead (41.6%) were the most numerous species sampled (Table 1). Other species caught included bigmouth buffalo, northern pike, common carp, walleye, orange spotted sunfish, and white sucker.

Table 1. Total catch from three overnight gill net sets at Twin Lakes, Sanborn County, July 5-6, 2010.

Species	Number	Percent	CPUE[1]	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Crappie	211	46.2	70.3	±1.9	0.3	1	0	135
Black Bullhead	190	41.6	63.3	±1.9	9.0	31	0	107
Bigmouth Buffalo	28	6.1	9.3	±1.9	7.0	--	--	--
Northern Pike	8	1.8	2.7	±1.9	0.4	--	--	--
Common Carp	7	1.5	2.3	±1.9	0.6	--	--	--
Walleye	7	1.5	2.3	±1.9	2.2	--	--	--
Orange Spotted Sunfish	3	0.7	1.0	±1.9	0.0	--	--	--
White Sucker	3	0.7	1.0	±1.9	0.3	--	--	--

* 5 years (2002, 2004, 2006, 2008, 2009)

Table 2. Catch per unit effort by length category for various fish species captured with gill nets in Twin Lakes, Sanborn County, July 5-6, 2010.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Crappie	14.7	55.7	55.0	0.7	--	70.3	±1.9
Black Bullhead	1.3	62.0	42.7	19.3	--	63.3	±1.9
Bigmouth Buffalo	9.3	--	--	--	--	9.3	±1.9
Northern Pike	1.7	1.0	1.0	--	--	2.7	±1.9
Common Carp	1.7	0.7	0.7	--	--	2.3	±1.9
Walleye	1.0	1.3	1.0	0.3	--	2.3	±1.9
Orange Spotted Sunfish	--	--	--	--	--	1.0	±1.9
White Sucker	--	1.0	1.0	--	--	1.0	±1.9

Length categories can be found in Appendix A.

Trap Net Catch

Black bullhead (89.0%) dominated the trap net sample in this year's survey (Table 3). Black crappies, common carp, bigmouth buffalo, northern pike, bluegill, largemouth bass and white sucker were also sampled.

[1] See Appendix A for definitions of CPUE, PSD, RSD-P, and mean Wr.

Table 3. Total catch from five overnight trap net sets at Twin Lakes, Sanborn County, July 5-6, 2010.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	3,900	89.0	780.0	±212.7	178.3	43	0	72
Black Crappie	272	6.2	54.4	±19.6	12.2	5	1	96
Common Carp	148	3.4	29.6	±8.1	2.7	2	1	101
Bigmouth Buffalo	41	0.9	8.2	±4.2	0.6	--	--	--
Northern Pike	11	0.3	2.2	±0.5	0.6	--	--	--
Bluegill	7	0.2	1.4	±1.5	2.8	--	--	--
Largemouth Bass	1	0.0	0.2	±0.3	0.0	--	--	--
White Sucker	1	0.0	0.2	±0.3	0.6	--	--	--

* 5 years (2000, 2002, 2004, 2006, 2008)

Table 4. Catch per unit effort by length category for various fish species captured with trap nets in Twin Lakes, Sanborn County, July 5-6, 2010.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Bullhead	725.4	54.6	31.2	23.4	--	780.0	±212.7
Black Crappie	11.6	42.8	40.8	1.6	0.4	54.4	±19.6
Common Carp	24.0	5.6	5.2	0.2	0.2	29.6	±8.1
Bigmouth Buffalo	8.0	0.2	0.2	--	--	8.2	±4.2
Northern Pike	1.6	0.6	0.4	0.2	--	2.2	±0.5
Bluegill	--	1.4	0.4	1.0	--	1.4	±1.5
Largemouth Bass	--	0.2	0.2	--	--	0.2	±0.3
White Sucker	--	0.2	0.2	--	--	0.2	±0.3

Length categories can be found in Appendix A.

Walleye

Management objective: Establish and maintain a walleye fishery following winterkills and whenever water levels are sufficient to sustain fish life for a reasonable length of time.

The 2007-2008 winterkill eliminated the walleye population in Twin Lakes. Walleye fry were stocked in 2008 (Table 7) to reestablish the population, but the stocked fish apparently did not survive. More walleyes were stocked in fall of 2009. These walleyes also had poor survival so walleye fingerlings were again stocked in 2010.

Table 3. Walleye gill-net CPUE, PSD, RSD-P, and mean Wr for Twin Lakes, Sanborn County, 2002-2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Mean*
CPUE	5.0		4.3		1.7		0.0	0.0	2.3	2.2
PSD	0		0		--		--	--	--	0
RSD-P	0		0		--		--	--	--	0
Mean Wr	92		79		--		--	--	--	86

* 5 years (2000, 2002, 2004, 2006, 2008)

Black Crappie

Management objective: Establish and maintain a black crappie fishery following winterkills and whenever water levels are sufficient to sustain fish life for a reasonable length of time.

Two year classes are evident in Figure 1. Larger individuals were most likely from the 2010 stocking, while the smaller fish were naturally-produced.

Table 4. Black crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Twin Lakes, Sanborn County, 2002-2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Mean*
CPUE	8.1		7.0		36.7		8.8	0.4	54.4	12.2
PSD	43		80		21		23	--	5	42
RSD-P	10		49		2		0	--	1	15
Mean Wr	121		95		94		98	--	96	102

* 5 years (2000, 2002, 2004, 2006, 2008)

Black Bullhead

Management objective: Maintain a black bullhead population with a trap-net CPUE of no more than 100.

Bullhead abundance has increased to problem levels because the predators have been eliminated by winterkill (Table 5). Bullhead length averaged only 123 mm (4.8 in) which is too small to be desirable to anglers.

Table 5. Black bullhead trap-net CPUE, PSD, RSD-P, and mean Wr for Twin Lakes, Sanborn County, 2002-2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Mean*
CPUE	628.3		2.7		1.1		186.8	72.6	780.0	178.3
PSD	13		58		--		7	13	43	23
RSD-P	0		0		--		0	0	0	0
Mean Wr	--		88		--		107	96	72	97

* 5 years (2000, 2002, 2004, 2006, 2008)

All Species

CPUE for common carp, black bullhead, northern pike, and black crappie is above average; all other species are below average in abundance (Table 6).

Table 6. Gill-net (GN) and trap-net (TN) CPUE for all fish species sampled in Twin Lakes, Sanborn County, 2002-2010.

Species	2002	2003	2004	2005	2006	2007	2008	2009	2010
SNG (TN)	--		0.2		0.3		--	--	--
COC (GN)	0.3		0.7		2.0		--	--	2.3
COC (TN)	0.9		0.5		0.8		2.8	8.6	29.6
WHS (GN)	0.7		0.3		0.3		--	--	1.0
WHS (TN)	1.5		1.0		0.4		--	--	0.2
BIB (GN)	20.7		7.7		6.7		--	--	9.3
BIB (TN)	1.9		0.8		0.4		--	--	8.2
BLB (GN)	35.7		0.3		1.3		1.5	6.3	63.3
BLB (TN)	628.3		2.7		1.1		186.8	72.6	780.0
NOP (GN)	1.0		1.0		--		--	--	2.7
NOP (TN)	1.7		1.1		0.3		--	--	2.2
WHB (TN)	0.1		--		--		--	--	--
OSF (GN)	--		--		--		--	--	1.0
OSF (TN)	--		--		0.1		--	--	--
GSF (TN)	--		--		1.2		--	--	--
HYB (TN)	0.5		0.3		0.4		0.2	6.2	--
BLG (TN)	0.5		3.2		10.1		--	0.4	1.4
SMB (TN)	1.0		0.8		--		--	--	--
LMB (TN)	--		--		--		--	--	0.2
WHC (TN)	0.2		0.1		0.2		--	--	--
BLC (GN)	--		--		1.3		--	--	70.3
BLC (TN)	8.1		7.0		36.7		8.8	0.4	54.4
YEP (GN)	0.3		0.7		0.7		--	--	--
YEP (TN)	0.1		--		0.2		--	--	--
WAE (GN)	5.0		4.3		1.7		--	--	2.3
WAE (TN)	2.8		1.2		4.3		--	--	--

SNG (Shortnose Gar), COC (Common Carp), WHS (White Sucker), BIB (Bigmouth Buffalo), BLB (Black Bullhead), NOP (Northern Pike), WHB (White Bass), GSF (Green Sunfish), OSF (Orange-spotted Sunfish), HYB (Hybrid Sunfish), BLG (Bluegill), SMB (Smallmouth Bass), LMB (Largemouth Bass), WHC (White Crappie), BLC (Black Crappie), YEP (Yellow Perch), WAE (Walleye)

MANAGEMENT RECOMMENDATIONS

1. Stock northern pike, yellow perch, walleye and black crappie as needed and following winterkills to maintain the fishery.

2. Continue to monitor the Twin Lakes fishery by conducting biennial netting surveys.

Table 7. Stocking record for Twin Lakes, Sanborn County, 1996-2010.

Year	Number	Species	Size
1996	38,200	Walleye	Sml. Fingerling
	2,620	Yellow Perch	Adult
1997	28,800	Walleye	Fingerling
	2,720	Yellow Perch	Adult
1998	26,200	Walleye	Fingerling
1999	13,585	Black Crappie	Juvenile
	26,200	Walleye	Fingerling
	11,895	Yellow Perch	Juvenile
2000	30,400	Walleye	Fingerling
	2,546	Yellow Perch	Adult
2001	26,640	Walleye	Fingerling
2003	262,000	Walleye	Fry
2005	26,400	Walleye	Fingerling
2006	27,000	Walleye	Fingerling
	2,824	Black Crappie	Adult
2008	3,399	Black Crappie	Adult
	300,000	Walleye	Fry
2009	253	Walleye	Adult
	849	Yellow Perch	Adult
	1,806	Yellow Perch	Juvenile
2010	2,828	Black Crappie	Adult
	53,770	Walleye	Fingerling
	69,782	Yellow Perch	Fingerling

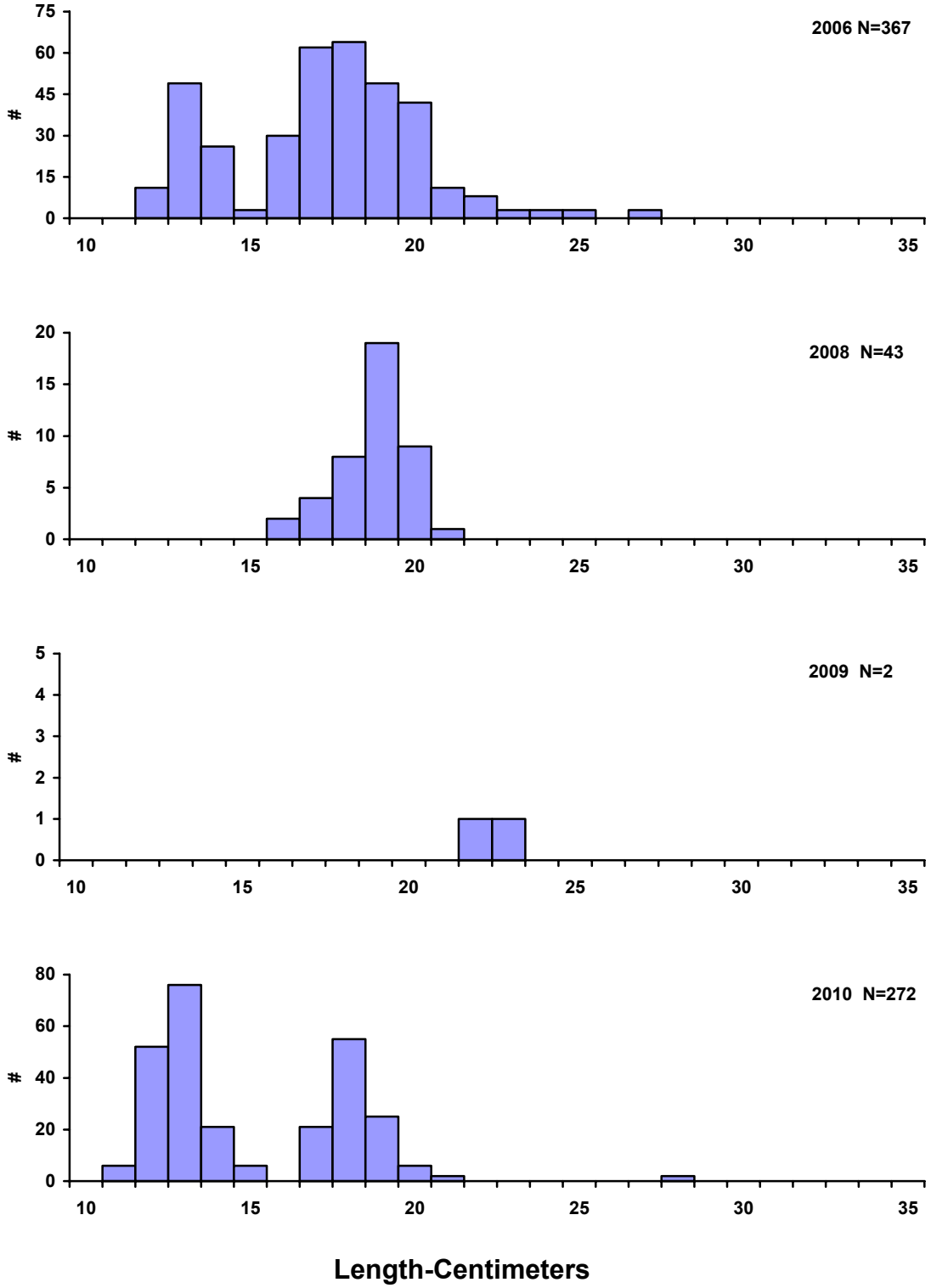


Figure 1. Length frequency histograms for black crappie sampled with trap nets in Twin Lakes, Sanborn County, 2006, 2008, 2009, 2010.

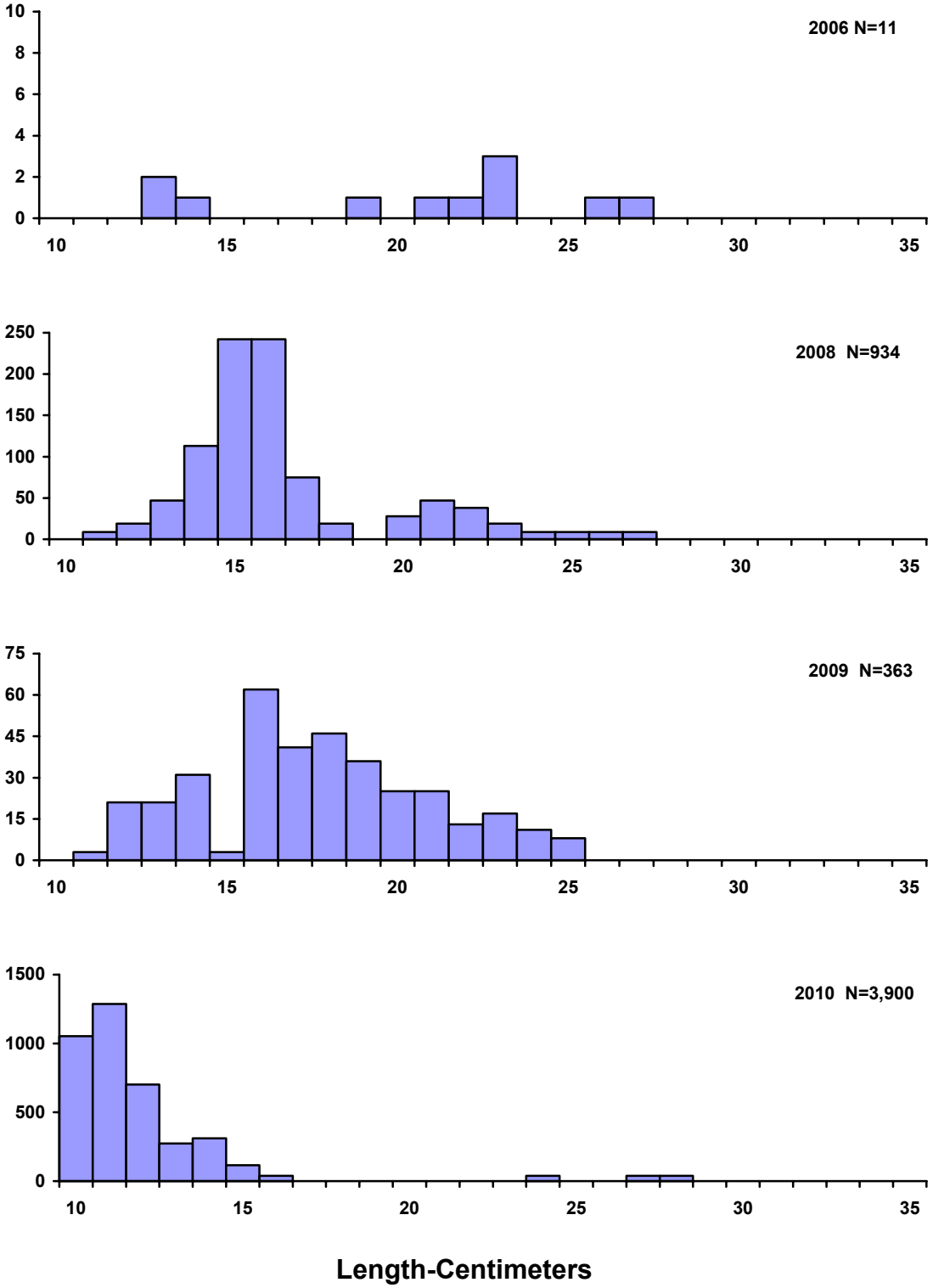
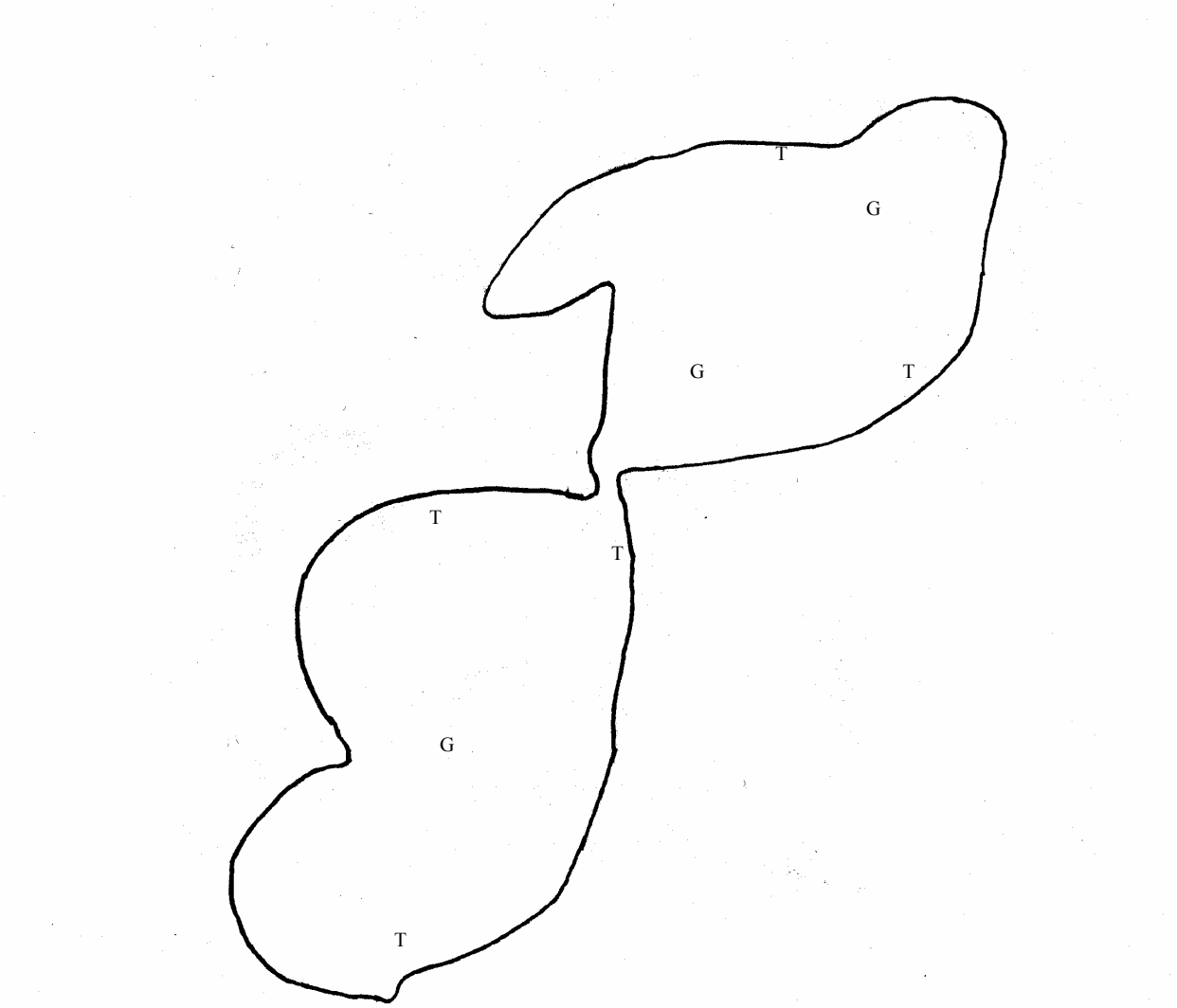


Figure 2. Length frequency histograms for black bullheads sampled with trap nets in Twin Lakes, Sanborn County, 2006, 2008, 2009, 2010.



Legend
Gill Nets: G
Trap Nets: T

Figure 3. Sampling locations on Twin Lakes, Sanborn County, 2010.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters. (inches in parenthesis).

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25 (10)	38 (15)	51 (20)	63 (25)	76 (30)
Yellow perch	13 (5)	20 (8)	25 (10)	30 (12)	38 (15)
Black crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
White crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
Bluegill	8 (3)	15 (6)	20 (8)	25 (10)	30 (12)
Largemouth bass	20 (8)	30 (12)	38 (15)	51 (20)	63 (25)
Smallmouth bass	18 (7)	28 (11)	35(14)	43 (17)	51 (20)
Northern pike	35 (14)	53 (21)	71 (28)	86 (34)	112 (44)
Channel catfish	28 (11)	41 (16)	61 (24)	71 (28)	91 (36)
Black bullhead	15 (6)	23 (9)	30 (12)	38 (15)	46 (18)
Common carp	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)
Bigmouth buffalo	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.